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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

SEIFU, LESSANEWORK T

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/523,749	Applicant(s) SUYAMA ET AL.	
	Examiner Lessanework T. Seifu	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) 9-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1-8, 19, and 20 in the reply filed on February 26, 2008 is acknowledged.

Response to Arguments

1. Applicant's arguments with respect to claims 1-8 and 19 have been considered but are moot in view of the new ground(s) of rejection. The interpretation of the previously applied reference, Castallo et al, no longer applies to the currently pending claims, since applicants have now amended claims 1 and 19 to recite "and reducing said oxygen/carbon atomic ratio of said biomass from 0.216 to 0.38". Therefore, the rejection has been withdrawn. However, upon further search and consideration, a new ground of rejection is made in view of a newly found prior art of reference as follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickinson et al (US 5,685,153) in view of Doi et al. (JP 2002-059118).

Regarding claims 1-8, Dickinson et al. disclose a method of upgrading carbonaceous waste, including cellulose based biomass already undergone shredding and is in a water slurry form (see col. 1, lines 55-65 and col. 5 lines 50-62), comprising: an upgrading step for performing upgrading treatment of the carbonaceous waste (see Abstract). The above disclosure encompasses applicants' limitation regarding the oxygen/carbon atomic ratio of the cellulose based biomass being at least 0.5.

Dickinson et al. disclose that the upgrading step is performed in presence of water, involves heating under pressure to a temperature at which a significant physical and molecular rearrangement occurs which includes the splitting off of a substantial portion

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of oxygen bound in the carbonaceous waste as carbon dioxide (see col. 5, lines 1-30).

Dickinson et al. teach that the temperature necessary to cause the molecular rearrangement depends on the characteristics of the feed slurry, but usually range from 220⁰ C to 370⁰ , and that the pressure necessary for the upgrading treatment is a function of the vapor pressure of the water at the maximum temperature (see col. 5, lines 19-26). The above disclosure meets applicants' limitation with respect to the upgrading treatment being conducted under a pressure of at least saturated water vapor pressure. Dickinson et al. further teach that during the upgrading treatment, the solid particles in the feed slurry are broken up into smaller particles of char (see col. 5, lines 26-31). Dickinson et al. further disclose a separation step for separating the treated product from the upgrading step into a solid component and a liquid component (see col. 12, lines 28-36), wherein the resulting solid component can be at least about 49% by weight (see col. 4, lines 44-58, and claim 3). Dickinson et al. disclose an example wherein a carbonaceous waste feed, with a dry basis oxygen content of 36.2 wt %, treated according to the method of their invention, resulted in an upgraded product having a dry basis oxygen content of 13.9 wt % (see Example 1). Dickinson et al. further disclose that the upgraded product by the process of their invention, can have a dry heating value of 12,740 BTU/lb (see Table 1), which falls within applicants claimed range with respect to the limitation in claim 7. Dickinson et al. are however silent with respect to the upgraded product having a reduced oxygen/carbon atomic ratio in the range as claimed or the product being at least 50% a volatile component.

Doi et al. teach a method for decomposing/hydrolyzing a cellulose based biomass with hot water and under a pressure beyond saturated water vapor pressure (see Abstract by Derwent, Novelty section). Doi et al. teach that by controlling the temperature and pressure of pressurized hot water, various types of desired products can be produced from a cellulose based biomass at high-speed and efficiency (see Abstract by Derwent, Advantage section).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the teachings of Dickinson et al. and Doi et al. for the purpose of producing an upgrading biomass having a reduced oxygen content, including an oxygen/carbon atomic ratio in the a range as claimed, because Doi et al. teach that by controlling the temperature and pressure of pressurized hot water, various types of desired products can be produced from a cellulose based biomass at high-speed and efficiency (see Abstract by Derwent, Advantage section).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the teachings of Dickinson et al. and Doi et al. for the purpose of producing an upgraded biomass having reduced amount of oxygen content, including an oxygen/carbon atomic ratio in the a range as claimed, and having a desired amount of volatile component, including volatile components in the range as claimed, because Doi et al. teach that by controlling the temperature and pressure of pressurized hot water, various types of desired products can be produced from a cellulose based biomass at high-speed and efficiency.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dickinson et al (US 5,685,153) in view of Doi et al. (JP 2002-059118) and White (US 3,698,881).

Dickinson et al. disclose a method of upgrading carbonaceous waste, including cellulosic base biomass, comprising: an upgrading step for performing upgrading treatment of the carbonaceous waste, (see Abstract and col. 1, lines 32-65). The above disclosure, encompasses applicants' limitation regarding the oxygen/carbon atomic ratio of the cellulose based biomass being at least 0.5. Dickinson et al. disclose that the upgrading step is performed in presence of water; the treatment is heated under pressure to a temperature at which a significant physical and molecular rearrangement occurs which includes the splitting off of a substantial portion of oxygen bound in the carbonaceous waste as carbon dioxide (see col. 5, lines 1-30). Dickinson et al. teach that the temperature necessary to cause the molecular rearrangement, depends on the characteristics of the feed slurry but usually range from 220⁰ C to 370⁰ , and the pressure necessary for the upgrading treatment is a function of the vapor pressure of the water at the maximum temperature (see col. 5, lines 19-26). The above disclosure meets applicants' limitation with respect to the upgrading treatment being conducted under a pressure of at least saturated water vapor pressure. Dickinson et al. further teach that during the upgrading treatment, the solid particles in the feed slurry are broken up into smaller particles of char (see col. 5, lines 26-31). Dickinson et al. further disclose a separation step for separating the product from the upgrading step into a solid component and a liquid component (see col. 12, lines 28-36) wherein the resulting

solid component can be at least about 49% by weight (see col. 4, lines 44-58, and claim 3). Dickinson et al. disclose an example wherein a carbonaceous waste feed, with a dry basis oxygen content of 36.2 wt %, treated according to the method of their invention, resulted in an upgraded product having a dry basis oxygen content of 13.9 wt % (see Example 1). Dickinson et al. disclose that the recovered solid component (char) from the process of their invention can further be subjected to gasification treatment (see col. 7, lines 49-60). Dickinson et al. are however silent regarding the upgraded product having a reduced oxygen/carbon atomic ratio in the range as claimed and the gasification treatment conditions for the separated solid components (char) .

Doi et al. teach a method for decomposing/hydrolyzing a cellulose based biomass with hot water and under a pressure beyond saturated water vapor pressure (see Abstract by Derwent, Novelty section). Doi et al. teach that by controlling the temperature and pressure of pressurized hot water, various types of desired products can be produced from a cellulose based biomass at high-speed and efficiency (see Abstract by Derwent, Advantage section).

White discloses a method of gasifying gaseous hydrocarbons or liquid or solid hydrocarbons to produce synthesis gas comprising hydrogen and carbon monoxide. White discloses gasification conditions including temperature in the range of 1200⁰ F to 3200⁰ F, pressure in the range from atmospheric to 450 psig, gasifying agent comprising oxygen in quantity insufficient for complete combustion and steam to produce the desired synthesis gas (see col. 2, lines 7-55).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the teachings of Dickinson et al. and Doi et al. for the purpose of producing an upgrading biomass having reduced oxygen content including an oxygen/carbon atomic ratio in the a range as claimed, because Doi et al. teach that by controlling the temperature and pressure of pressurized hot water, various types of desired products can be produced from a cellulose based biomass at high-speed and efficiency (see Abstract by Derwent, Advantage section).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have combined the teachings of Dickinson et al., Doi et al. and White, and used the gasification method disclosed in the reference of White to gasify upgraded products made by the teachings of Dickinson et al. and Doi et al. because Dickinson et al. disclose that the upgraded solid components by the process of their invention can be used as a reactive source of carbon and hydrogen for gasification to synthesis gas (see col. 7, lines 49-60).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lessanework T. Seifu whose telephone number is (571)270-3153. The examiner can normally be reached on Mon-Thr 7:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797